

REMARKS/ARGUMENTS:

In the specification:

The description of Figure 3, beginning at page 6, line 17, was amended by adding the word “to” in the first line of the paragraph in order to correct a typographical omission.

The paragraph beginning at page 7, line 1, was amended to correct the spelling of the word “Poaceae”, in the eighth line of the paragraph.

The paragraph beginning at page 3, line 9, was amended to correct the spelling of the word “huts” in the fourth line of the paragraph.

The description of Figure 4, beginning at page 6, line 22, and the paragraph beginning at page 21, line 26, were amended to make the description correspond with the photograph.

The paragraph beginning at page 13, line 7, has been amended to correct the typographical error in the third line of the paragraph by replacing “ml/l” with the correct term --- mg/l---.

The drawings, which were originally filed as color photographs, have been replaced with black and white photographs. Also, the figure labels have been changed so that the figure labels match the description of the figures in the specification, specifically, the figure labels have been changed from all caps to having only the first letter capitalized.

In the claims:

Claims 2 – 4, 9 – 14, 16, 29 and 31 have been cancelled. The cancelled claims may be reasserted in a related case, and their cancellation is not intended to be, nor should it be deemed to be, an admission of the lack of patentability of the cancelled claims.

Claims 24 – 27 have been withdrawn from consideration in the present case.

Claims 1, 5 - 8, 15, 17 - 19, 21, 23, 28 and 30 have been amended. Support for the amendments to the claims can be found in the original specification and claims as follows.

Claim 1 has been amended by adding a description of the families of

Monodotyledonae that are to be included within the scope of the claim. Support for this feature can be found at least in the first paragraph of page 7.

Claim 5 has been amended to correct dependency and to clarify the language of the claim.

Claim 6 has been amended to delete the various species of plants, while focusing on plant genres that are covered, and to replace the “comprising” language, which was objected to, with the term “is”.

Claims 7, 8, 15, 17, 21, 28 and 30 have been amended to correct dependency.

Claim 8 has been further amended by clarifying the language to avoid the lack of antecedent basis for the “developing but still unemerged immature inflorescence.”

Claims 15 and 17 have been additionally amended to clarify the language of the claim by specifying the medium in which the particular plant hormones are found.

Claim 18 has been amended to correct the spelling of the word “totipotent”.

Claim 19 has been amended to clarify that it is the cocultivation of *A. tumefaciens* with the totipotent tissue that is being described.

Claim 21 has been amended by re-writing the claim as a dependent claim, depending from claim 1.

Claim 23 has been amended to clarify the language of the claim.

Claim 28 has been amended by re-writing the claim as a dependent claim, depending from claim 18.

Claim 30 has been amended by re-writing the claim as a dependent claim, depending from claim 21.

Claims 32 – 62 have been added. It is believed that the new claims are drawn to the same subject matter as the claims of the group(s) that was elected for prosecution in the present case, and it is respectfully requested that the new claims be examined as a part of the elected group(s). In particular, new claims 32 – 40 depend ultimately from claim 1, with additional features finding support as follows:

Support for the feature of claim 32 the duration of cocultivation with *Agrobacterium tumefaciens* can be found in the specification, at least at page 20, line 25.

Support for the species listed in claim 33 is found at least in original claim 6.

Support for the case where the plant is *Arundo donax*, as described in claim 34, is found at least in each of the examples.

Support for the *Spartina* species listed in claim 35 is found at least in original claim 6.

Support for the features of claim 36 are found at least in original claim 15.

Support for the specific plant hormones of the primary and secondary mediums that are described in claim 37 can be found at least in the paragraph that begins at line 5 on page 11.

Support for the specific plant hormones of the primary and secondary mediums, and the amounts that are used, which are described in claims 38 and 39 can be found at least in the paragraph that begins at line 14 on page 11.

Support for the level of thiadiazuron in the secondary medium that is described in claim 40 can be found at least at page 13, line 9.

Claim 41 is similar to claim 1, except that the limitation to certain plant families has been deleted, and a feature describing the primary medium as containing at least two different auxins has been added. Support for this feature can be found at least at page 11, and in each of the examples, where at least two different auxins are included in each preferred primary medium that is disclosed.

Claims 42 – 62 are modeled after the original claims and the new claims 32 – 40, which are described above, and find support at the same locations as described for those claims.

Claims 1, 5 - 8, 15, 17 – 23, 28, 30, and 32 - 62 are now in the case.

No new matter has been added.

Making the election requirement Final:

The Examiner's decision to merge the claims of Group I (1 – 17 and 21) with the claims of Group II (18 – 20, 22 and 23) for the present prosecution is appreciated. The decision to make Final the restriction of the claims of Groups III and IV is noted.

Objection to the Drawings:

The drawings that were filed with the original application were objected to on the

ground that the figure labels don't match the specification, and a corrected specification or corrected drawings is required. Also, the color photographs were objected to on the ground that a petition for acceptance of color photographs had not yet been submitted.

On May 20, 2002, Applicant filed a Preliminary Amendment, which was directed to the correction of several of the issues that were pointed out in the Action dated April 20, 2003. A copy of that Preliminary Amendment is enclosed herewith. It is respectfully requested that the Preliminary Amendment of May 20, 2003, be entered into the case.

New black and white photographs of the figures originally filed in the case are enclosed herewith. It is requested that the color photographs that were originally filed be replaced with the black and white photographs.

It is believed that consideration and entrance into the case of the Preliminary Amendment dated May 20, 2003, and the substitution of the black and white photographs that are enclosed herewith resolve all of the objections raised in the present Action regarding the drawings, and it is respectfully requested that the objection to the drawings be reconsidered and withdrawn.

Provisional rejection of claims 1 – 4, 7 – 11 and 16 – 23 under a nonstatutory double patenting rejection over copending Application No. 10/068,600.

Pending the Applicant's amendments to the present claims, and Applicant's decision regarding further prosecution of the copending 10/068,600 application, it is respectfully requested that the present rejection be held in abeyance pending the definition of patentable subject matter in the present application.

Correction of the specification:

The specification has been amended to correct the misspelling of "huts" at page 3, line 12.

Because the new drawings are labeled with the term "Figure", those references in the specification to the same term are now proper.

Objection to claims 18 – 20 on account of misspelling:

Spelling of the word "totipotent" has been corrected in claims 18 and 19.

Rejection of claims 6, 8, 12, 13 and 15 - 20 under 35 USC §112, second paragraph, as being indefinite.

In claim 6, “comprising” has been replaced with “is”, and the various species have been deleted. In claims 33 and 43, where the species are again listed, the full names of the species are provided.

Claim 8 has been amended by replacing the word “the” with the term “a” in order to clarify what is claimed and to resolve the lack of antecedent basis.

Claims 12 and 13 have been cancelled.

Claim 15 has been amended to clarify that the auxin of the primary medium must include, but is not limited to, the three particular auxins that are listed, and likewise, that the primary medium must include, but is not limited to, the three cytokinins that follow.

Claim 16 has been cancelled.

Claim 17 has been amended to specify that the cytokinin of the secondary medium is thiadiazuron. The amendment resolves the issue regarding the use of the term “comprising” in this situation, and also resolves the issue regarding the antecedent basis for the term “cytokinin”, which is referenced in claim 1, from which claim 17 depends.

Rejection of claims 1, 6, 10, 11 and 14 under 35 USC §102(b) as being anticipated by the publication of Li *et al.*, World Congress on Cell and Tissue Culture.

It is respectfully requested that the rejection of claims 1, 6, 10, 11 and 14 under 35 USC §102(b) as being anticipated by the publication of Li *et al.*, World Congress on Cell and Tissue Culture be reconsidered in view of the amendments to the claims and the reasons that follow, and be withdrawn.

Claim 1, as amended, and new claim 41, require that an explant of living tissue from a plant be cultivated on a primary medium containing an auxin and a cytokinin to produce totipotent tissue, and that the totipotent tissue then be transferred to a secondary medium containing a cytokinin to produce plantlets having roots and shoots. It is respectfully maintained that the Li reference that discusses the tissue culture of *Spartina alterniflora*, as well as other publications by Li that describe tissue culture of *S.*

patens (Li *et al.*, *Aquatic Botany*, 51:103-113 (1995)), and *S. cynosuroides* (Li *et al.*, *Wetlands*, 16(4):410 – 415 (1996)), do not disclose each and every element of the claim, as is required for anticipation of the claim.

As noted in the Action of April 22, 2003 (page 10 first paragraph), neither the Li abstract (World Congress on Cell and Tissue Culture), the 1995 Li *et al.* *Aquatic Botany* article, or the 1996 Li *et al.* *Wetlands* article teach cultivation of totipotent tissue on a secondary medium to produce complete plantlets, as is now a feature of claims 1 and 41, nor do these references teach cultivation on a tertiary medium free of plant hormones, or the use of an inflorescence as an explant, or genetic transformation by any method.

Furthermore, it is maintained that none of the three Li references teach that the primary medium contains a cytokinin. In particular, it should be noted that in the 1995 Li *et al.* article in *Aquatic Botany*, last paragraph on page 105, it is stated that coconut water is “thought to contain cytokinins”, and further that this “...would explain the reduced callus formation that resulted when CW [coconut water] was added to the ADM medium [the callus induction medium] ...”. It is maintained that this teaching, contained in an article by the same author that is more recent by two years than the 1992 poster presentation cited in the last Action, falls short of the level of disclosure required by 35 USC §102. Nor, is it believed, can such a statement support an obviousness rejection under 35 USC §103. In fact, the teaching appears to teach away from the present invention, by inferring that the inclusion of cytokinins in the primary medium actually reduces callus formation. Accordingly, it is maintained that this teaching does not teach or make obvious the use of a cytokinin in the primary medium, as is required in every present claim.

Accordingly, it is maintained that the Li reference cited in the Action does not teach every element of the present claims, and it is respectfully requested that the present ground of rejection be reconsidered and withdrawn.

Rejection of claims 1 – 23 under 35 USC §103(a) as obvious over any one of Li *et al.* (World Congress on Cell and Tissue Culture); Li *et al.*, *Aquatic Botany*, 51:103-113 (1995), or Li *et al.*, *Wetlands*, 16(4):410 – 415 (1996), in view of Gallagher *et al.*,

Meagher et al., Sutter, Hartmann et al., Linder et al., and Anonymous (WAMPS).

It is respectfully requested that the rejection of claims 1 – 23 under 35 USC §103(a) as obvious over any one of Li et al. (World Congress on Cell and Tissue Culture); Li et al., *Aquatic Botany*, 51:103-113 (1995), or Li et al., *Wetlands*, 16(4):410 – 415 (1996), in view of Gallagher et al., Meagher et al., Sutter, Hartmann et al., Linder et al., and Anonymous (WAMPS), be reconsidered in view of the amendments to the claims and upon consideration of the reasons below and be withdrawn.

Claims 1 and 41, and all claims that depend therefrom, require that an explant of living tissue from a plant be cultivated on a primary medium containing an auxin and a cytokinin to produce totipotent tissue, and that the totipotent tissue then be transferred to a secondary medium containing a cytokinin to produce complete plantlets having roots and shoots. Claim 1 is further limited to certain families of Monocots, and claim 41 is further limited to the use of two different auxins in the primary medium.

As discussed above, neither the Li abstract (World Congress on Cell and Tissue Culture), the 1995 Li et al. *Aquatic Botany* article, or the 1996 Li et al. *Wetlands* article teach the use of a cytokinin in the primary medium, or the cultivation of totipotent tissue on a secondary medium to produce complete plantlets, as are now features of claims 1 and 41. Moreover, among other things, these references do not teach cultivation on a tertiary medium free of plant hormones, or the use of an inflorescence as an explant, or genetic transformation by any method. Accordingly, in order to support a *prima facie* case of obviousness under 35 USC §103, the missing features must be provided by another reference(s). The prior art must also provide a motivation to combine the references to arrive at the claimed invention, and must also show that the asserted combination provides a reasonable expectation of success. As discussed below, it is respectfully maintained that no combination of the presently cited references provides all of the missing features of the present claims and the motivation to combine them to arrive at the present invention.

Gallagher et al. (Selecting halophytes for agronomic value: Lessons from whole plants and tissue culture, 1993), describes the investigation of certain halophytes for potential use as food or feed crops. Although tissue culture is mentioned, no specific methods or techniques are described. The article notes that the researchers plan to

introduce foreign DNA into the halophyte genome, but that “this work is very difficult and a relatively long lead time is necessary to have the techniques perfected.” (See p. 10, third paragraph). It is maintained that the Gallagher *et al.* reference does not add any of the teachings missing from the primary references, and, therefore, cannot support a finding of obviousness.

U.S. Patent No. 5,965,796 to Meagher *et al.* describes metal resistance sequences and transgenic plants, but does not describe tissue culture in detail. It is maintained that this reference does not teach anything about the hormone composition of tissue culture media – in particular it does not teach the use of an auxin, or of two different auxins, and a cytokinin in a primary medium, or the cultivation of totipotent tissue on a secondary medium containing a cytokinin to produce whole plantlets.

Sutter, E. G., in Plant Tissue Culture concepts and Laboratory Exercises, R. N. Trigiano and D. J. Gray, Eds., pp. 12 – 25, CRC Press (1996), describes general laboratory requirements, media, and sterilization methods for plant tissue culture. The teachings, however, are of a general nature and, although many plant growth hormones and media are described, there is no teaching that an explant is cultivated on a primary medium containing an auxin and a cytokinin, and then the resulting totipotent tissue is transferred to a secondary medium containing a cytokinin to produce whole plantlets with roots and shoots, as is required in the present claims. Moreover, there is no teaching that the primary medium should contain two different auxins, or that the method is to be practiced with certain families of monocots.

Like the Sutter reference discussed above, Hartmann *et al.*, in Ch 16 and Ch 17 of Plant Propagation, 5th Ed., H. T. Hartmann, D. E. Kester, and F. T. Davies, Eds., Prentice Hall Career and Technology (1990), generally describes principles of tissue culture for micropropagation and techniques of *in vitro* culture for micropropagation. The reference describes a “common culture medium ... [in which the] initiation of cell division and subsequent callus production requires that both a cytokinin and an auxin be supplied in the proper proportion.” (See page 471, right hand column), but because this work is a general work that deals with plants of all types, it is maintained that this teaching can only rise to the level of being obvious to try, rather than making the presently claimed invention obvious. Furthermore, it is maintained that the Hartmann *et*

al. reference does not teach the cultivation of totipotent tissue on secondary medium containing a cytokinin to obtain whole plantlets having roots and shoots. Rather, it appears to teach shoot formation and root formation in separate stages. Shoot multiplication is discussed at page 505, right hand column, and, at page 506, left hand column, the transfer of the tissue to a third stage for rooting is described.

Accordingly, it is maintained that this reference does not add the elements that are missing from the primary references, and, therefore, that it cannot support a *prima facie* case of obviousness under 35 USC §103.

The abstract by Linder *et al.* describes tissue culture of *A. donax*, but does not disclose the use of a cytokinin in the primary medium, and also, does not mention that the totipotent tissue from culture on the primary medium is transferred to a secondary medium containing cytokinin for the production of whole plantlets.

The website printout on *Spartina alterniflora*, by the Western Aquatic Plant Management Society (Anonymous (WAMPS)), describes this species and its distribution and horticultural characteristics in general, but does not describe tissue culture.

It is maintained, therefore, that none of the cited references, alone or in combination, teach or suggest each and every limitation of the present claims, and it is respectfully requested that the present ground of rejection be reconsidered and withdrawn.

Request for reconsideration:

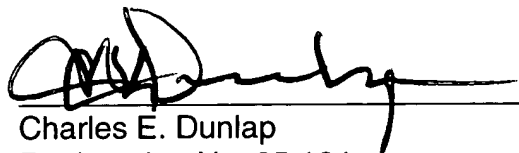
It is respectfully requested that the amendments to the specification and the claims that are described above be entered into the case, and that the claims be found to be allowable and the case passed to issue. If one or more of the claims are deemed to not be allowable, the Examiner is invited to call the undersigned attorney at the number given below for resolution of any remaining issues.

Respectfully requested,

NELSON MULLINS RILEY & SCARBOROUGH

Date

July 21, 2003

A handwritten signature in black ink, appearing to read "Charles E. Dunlap", written over a horizontal line.

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